

ABSTRACT

A combustion system for a gas turbine engine includes a Catalyst (CAT) combustion sub-system for generating combustion products under a lean premixed fuel/air condition in the presence of a Catalyst and a Dry-Low-Emissions (DLE) combustion sub-system, for generating combustion products under a lean premixed fuel/air condition. Gaseous and liquid fuels are used for the DLE combustion sub-system while only gaseous fuel is used for the CAT combustion system. The engine operates at start-up and under low load conditions with the DLE combustion system and switches over the combustion process to the CAT combustion sub-system under high load conditions. Thus the combustion system according to the invention combines the advantages of DLE and CAT combustion processes so that the gas turbine engine operates over an entire operating range thereof at high engine efficiency while minimizing emissions of nitrogen oxides and carbon monoxide from the engine.